TS220C-01 Electro-Optical Pod Specification

Total 6 pages

1. Overview

1. 1 Range

This document specifies the technical requirements and technical status of the infrared photoelectric image stabilization platform (hereinafter referred to as "image stabilization platform").

This document is applicable to the design, manufacture and acceptance of image stabilization platform.

1. 2 Introduction

The TS220C-01 electro-optical pod is a stable infrared and visible imaging system with integrated laser ranging, which can be widely used in helicopters,fixed-wing aircraft and drones.The main applications of this imaging system include law enforcement, search and rescue, police security, survey and patrol, forest fire prevention and extinguishing, and other fields.

Figure 1 Appearance of TS220C-01

3 Function

3.1 HD EO sensor and MWIR(cooled) dual-light imaging are adopted;

3.2 High-precision visual axis stabilization;

3.3 Capable of detecting and identifying ground targets;

3.4 With search, tracking, locking, guidance and other working modes (fixed/moving target);

3.5 Functions of character overlay, customization and display.

3.6 Picture-in-picture function;

3.7 Storage and photographing.

3.8 With target positioning;

3.9 Laser ranging function;

3.10 Fog penetration and automatic focusing;

3.11 MWIR has the functions of black and white thermal display, automatic focusing and one-key correction;

3.12 Serial port online upgrade function (upgrade without removing the cover);

3.13 Function of self-checking and fault diagnosis (giving the fault mode and code).

4 Performance parameter index

4.1 Eo Sensor

(1) Wavelength: 0.4 μm ~ 0.9 μm;

(2) Pixel: 1920 × 1080;

(3) Focal length: 5.9 mm ~ 265.5mm, optical 45x continuous zoom;

(4) H*FOV: 56.3º ~ 1.9º;

Table 1 Operating distance of visible light

Aim	Target size（m）	Detection distance (km)	Identify the distance (km)
People	0.5×1.8	7	3
Vehicle	3×6	25	12

4.2 MWIR(cooled)

(1) Wavelength: 3 μm ~ 5 μm;

(2) Resolution: 640 × 512;

(3) Pixel: 15 um;

(4) NETD: 30mk@25℃;

(5) Focal length: 18mm ~ 275mm/F5.5, continuous zoom;

(6) FOV: 28º × 22.4º ~ 2.0º × 1.6º.

Table 2 Infrared Operating Range

Aim	Target size（m）	Detection distance (km)	Identify the distance (km)
People	0.5×1.8	4	1
Vehicle	3×6	14	6

4.3 Laser rangefinder

(1) Wavelength: 1535nm;

(2) Accuracy: ± 3m;

(3) Ranging frequency: 1Hz;

(4) Laser ranging distance: 8km.

4.4 Servo system

(1) Rotation range:

Pan: n × 360 ° continuous rotation,

Pitch: -110 ° ~ + 10 ° (horizontal direction is 0 °, upward is positive)

(2) Angle measurement accuracy: ≤ 2mrad;

(3) Stabilization accuracy: ≤ 100μrad (1σ) (2 °/1Hz, 1 °/2Hz swing);

(4) Maximum angular velocity: ≥ 60 °/s;

(5) Maximum angular acceleration: ≥ 90 °/s ^{2}.

4.5 Tracking parameters

（1）Pixel deviation update rate: 50hz;

（2）Tracking speed: 30 pixels/frame;

（3）Minimum target contrast: 8%;

（4）Minimum target imaging size: 4 × 3 pixels;

（5）In the case of rolling, rapid reduction or enlargement of target imaging, it has the ability of tracking without slippage and loss.

（6）Automatically recapture the target after the short-term occlusion of clouds and ground scenes is eliminated.

5 Power supply characteristics

(1) Nominal DC voltage: 24 V;

(2) Normal power supply voltage range: 22V ~ 28V;

(3) Average power consumption: ≤ 50W;

(4) Peak power consumption: ≤ 150W.

6 Structural parameters

(1) Size: ≤ Φ220mm × 291.5mm;

(2) Weight: ≤ 7 kg. (Including laser ranging)

7 Use environment

(1)Working temperature: -20℃～55℃.

(2)Storage temperature: -30℃～60℃.

8 Interface

8.1 Communication interface

Control: RS422, network control interface;

Video interface: Network;

Quality control and servo upgrade, maintenance and repair interfaces are reserved to realize online upgrade and maintenance of software.

Note: The control network port and the video output network port are the same Ethernet port.

8.2 Electrical interface

The photoelectric image stabilization platform has two types of electrical connectors: J29A rectangular connector is used for power supply, and J30J rectangular connector is used for communication, upgrade and network video output.

See Table 3 and Table 4 for interface definition.

Table 3 Definition of rectangular connector (J29A-9ZKP)

Serial number	Signal definition	Socket core number	Signal direction	Remark
1	P24V	1，2，3，4	Carrier → image stabilization platform	
2	PGND	6，7，8，9	Carrier → image stabilization platform	
3	Empty	5		

Table 4 Definition of Rectangular Connector (J30J-15ZKP)

Serial number	Signal definition	Socket core number	Signal direction	Remark
1	RS422RX+	1	Carrier → image stabilization platform	Master 422
2	RS422RX-	2	Carrier → image stabilization platform	
3	RS422TX+	9	Image stabilization platform → carrier	
4	RS422TX-	10	Image stabilization platform → carrier	
5	DGND	3，4		
6	RS422RX+	5	Upper computer → image stabilization platform	Maintenance 422
7	RS422RX-	6	Upper computer → image stabilization platform	
8	RS422TX+	11	Image stabilization platform → upper computer	
9	RS422TX-	12	Image stabilization platform → upper computer	
10	Ethernet RX +	7	Carrier → image stabilization platform	Hundred megabytes network
11	Ethernet RX-	8	Carrier → image stabilization platform	
12	Ethernet TX +	13	Image stabilization platform → carrier	
13	Ethernet TX-	14	Image stabilization platform → carrier	
14	Empty	15		

8.3 Mechanical interface

See Figure 2 for the mechanical interface of the pod.

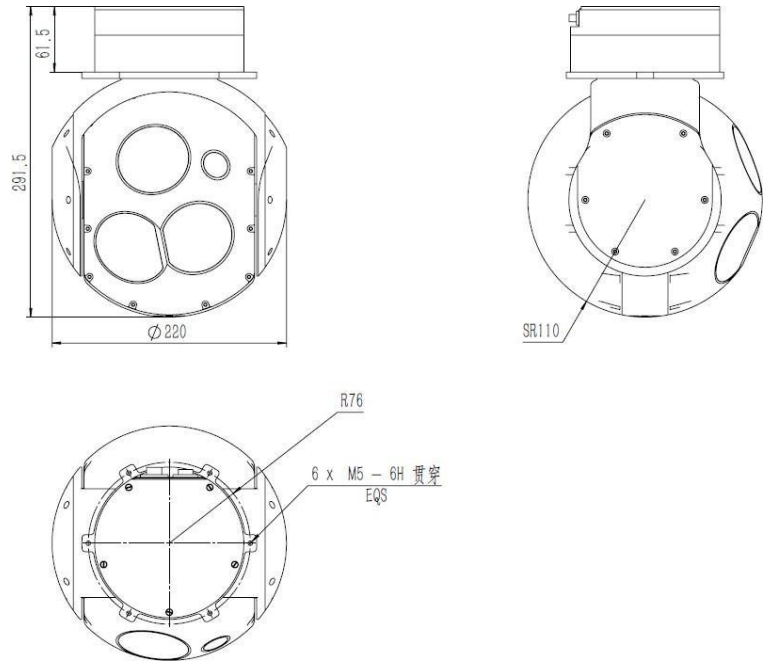

Fig. 2 Mechanical Interface of TS220C-01